Attachment B. Measures to Minimize Environmental Harm

The following section summarizes the mitigation measures described in the Final EIS that will be used to avoid or minimize environmental harm associated with the management actions that will be implemented under this decision. The responsible parties for implementing these measures are parenthetically noted at the end of each measure. These parties include North Cascades National Park Service Complex (NOCA), Pacific West Regional Office (PWRO), Denver Service Center (DSC), Federal Highway Administration (FHWA) and contractors (CON).

Land Use

- Clearly identify the construction limits, to prevent expansion of construction operations into undisturbed areas (NOCA).
- Work with Chelan County on zoning and land use planning (NOCA).
- Minimize disturbance from reroutes by incorporating toe walls at fill locations where feasible (FHWA-CON).
- Retain some sensitive lands previously proposed for exchange (NOCA).
- Reduce the number of acres within the lower valley offered for exchange (NOCA).
- Combine maintenance functions in buildings where possible (NOCA).
- Restore the former maintenance and housing areas (NOCA).
- Limit circulation space associated with new housing and maintenance areas to functional needs (NOCA).
- Minimize clearing of vegetation associated with the road rehabilitation (FHWA-CON).
- Continue to exchange or acquire private lands in the floodplain and/or channel migration zone as identified by Land Protection Plan priorities (NOCA).
- Restore some riparian areas to natural conditions (NOCA-FWHA-CON).
- Continue to use conditions, covenants and deed restrictions (CCRs) on exchanged public lands when private development is proposed (NOCA).

Air Quality

- Chip or mulch vegetation on site rather than disposing of it offsite or burning it (NOCA-FHWA-CON).
- Spray water to minimize fugitive dust resulting from roadway construction (FHWA-CON).
- Cover trucks transporting soils and aggregate to Lake Chelan barge (NOCA-FHWA-CON).
- Encourage contractor employees and National Park Service (NPS) employees to travel in groups to and from the project site (rather than in multiple separate vehicles) (NOCA-FHWA-CON).
- Revegetate bare ground and staging areas as soon as possible (upon final grading or when staging area is no longer in use) (NOCA-FHWA-CON).
- Minimize the extent of vegetation removal associated with road rehabilitation (FHWA-CON).
- Encourage the use of local labor sources and large-volume materials delivery to minimize trip generation during construction activity (NOCA-FHWA-CON).
- Do not locate wood-burning stoves or fireplaces in buildings (NOCA).
- Use propane and solar devices for heating (NOCA).
- Use low VOC paints, solvents and other chemicals in building construction (NOCA-CON).

- Encourage construction vehicles and equipment to limit any idling to no longer than 15 minutes when not in use (FHWA-CON).
- Encourage use of a biodiesel mix fuel rather than traditional diesel fuel (NOCA-FHWA-CON).

Soils

- Locate staging areas where they would minimize new disturbance of area soils and vegetation (FHWA-CON).
- Minimize ground disturbance to the extent practicable (NOCA-FHWA-CON).
- Minimize construction along water courses during periods of heavy precipitation (NOCA-FHWA-CON).
- Minimize driving over or compacting root-zones (NOCA-FHWA-CON).
- Use mats or plywood to minimize soil compaction impacts in wetlands (NOCA-FHWA-CON).
- Salvage topsoil and duff from excavated areas for use in re-covering source area or other project areas (FHWA-CON).
- Windrow topsoil at a height less than three feet to preserve soil microorganisms (FHWA-CON).
- Do not leave excavated soil alongside trees and protect specimen trees (FHWA-CON).
- Reuse excavated materials where possible in the project area (FHWA-CON).
- Revegetate project areas through native seeding and planting NOCA-FHWA-CON).
- Import weed-free, clean fill (FHWA-CON).
- Store imported topsoil and fill in a weed free area and covered by weed cloth to prevent contamination (FHWA-CON).
- Identify clearing limits to minimize the amount of vegetation loss (FHWA-CON).
- Clear and grub only those areas where construction would occur (FHWA-CON).
- Reuse topsoil from the reroute areas, to the extent practicable, to obliterate and revegetate abandoned road sections (NOCA-FHWA-CON).
- Prepare and approve a hazardous spill plan or Spill Prevention, Containment and Control Plan (SPCC), whichever is appropriate, before construction begins (NOCA-FHWA-CON).
- Use vegetable oil-based hydraulic fluid in heavy equipment (NOCA-FHWA-CON).

Vegetation

- Minimize construction limits and areas to be cleared, where possible (NOCA-FHWA-CON).
- Clearly identify the construction limits, to prevent expansion of construction operations into undisturbed areas (NOCA-FHWA-CON).
- Revegetate road reroute clearing areas not occupied by the roadway (NOCA-FHWA-CON).
- Retain specimen trees where possible adjacent to erosion protection sites and along the reroute/realignment areas (as identified by park staff) (NOCA-FHWA-CON).
- Salvage plant material, prior to construction, from areas to be disturbed (NOCA-FHWA-CON).
- Replant salvaged plants on reroute side slopes and obliterated areas to accelerate site recovery and to reduce the opportunity for exotic species to establish (NOCA-FHWA-CON).
- Continue to use CCRs associated with the development of exchanged lands to address clearing of vegetation; location and design of access roads and utilities; density, height, design and color of visible development; and access for management of natural and cultural resources (NOCA).
- Restore staging and other temporarily impacted areas following construction (NOCA-FHWA-CON).
- Obliterate and revegetate abandoned road segments and areas disturbed by construction with native plant species (NOCA-FHWA-CON).
- Use bioengineering techniques such as willow layering to stabilize river banks (NOCA).
- Minimize actions that affect endangered, threatened, or sensitive plant species in the project area (NOCA-FHWA-CON).

- Keep fill slopes as steep as possible where fill is proposed to raise the road to minimize the disturbance footprint (NOCA-FHWA-CON).
- Minimize clearing of vegetation associated with reroutes by incorporating toe walls at appropriate locations (NOCA-FHWA-CON).
- Conduct additional surveys for sensitive species, particularly where erosion protection measures or recreational facilities would be constructed (NOCA).
- Only import freshly exposed subsurface materials (NOCA-FHWA-CON).
- Avoid the use of stockpiled materials from the Company Creek Pit unless designated for the project (NOCA-FHWA-CON).
- Ensure that imported topsoil, fill and other construction materials capable of harboring seeds are weed free, and include certification if applicable (NOCA-FHWA-CON).
- Wash all vehicles prior to barging to Stehekin. This includes all vehicles, but especially those having contact with soil or materials that may contain noxious weed seed prior to working in weed free areas or transporting weed free materials (NOCA-FHWA-CON).
- Cover stored soil and rock, as appropriate, to prevent exposure to noxious weed seed (NOCA-FHWA-CON).
- Separate contaminated soil from weed free soil and using the contaminated soil for subsurface fill (NOCA-FHWA-CON).
- Conduct annual monitoring for potential weed infestation using early detection / rapid response eradication techniques (NOCA).
- Identify and control exotic plant species infestations prior to construction (especially associated with the airstrip and old roads) (NOCA).

Water Resources

- Locate staging and stockpiling areas away from the Stehekin River (NOCA-FHWA-CON).
- Delineate staging areas to prevent incremental expansion of the staging area (NOCA-FHWA-CON).
- Cover stockpiled fine-grained soil and rock near surface water and if overwintered with a breathable, water repellent fabric, such as silt fence, anchored around the perimeter (NOCA-FHWA-CON).
- Use temporary sediment control devices such as filter fabric fences, sediment traps, or check dams as needed during culvert replacement (NOCA-FHWA-CON).
- Identify the area to be cleared to define extent and clearing only those areas necessary for construction (NOCA-FHWA).
- Minimize the amount of disturbed earth area and the duration of soil exposure to rainfall (NOCA-FHWA-CON).
- Use bioengineering to stabilize riverbanks where erosion protection measures are employed (NOCA).
- Minimize soil disturbance and re-seed or revegetate disturbed areas as soon as practical (NOCA-FHWA-CON).
- Use available topsoil and duff from the reroute areas to rehabilitate (re-create habitat) in the obliterated road segments and road shoulders where reroutes occur (NOCA-FHWA-CON).
- Scarify slopes, if necessary, to slow erosion (NOCA-FHWA-CON).
- Stabilize disturbed areas until seeding and/or revegetation takes hold (NOCA-FHWA-CON).
- Construct temporary diversion devices such as swales, trenches, culverts, or drains to divert storm water runoff away from disturbed areas, including exposed slopes (NOCA-FHWA-CON).
- Use native duff and topsoil to cover exposed soil as soon as practical (NOCA-FHWA-CON).
- Install protective construction fencing around, adjacent to, or near wetland and/or riparian areas that are to be protected and/or other erosion management measures to protect water resources in the project area (NOCA-FHWA-CON).
- Avoid machinery use below the wetted perimeter of water bodies (work would be done from the bank) where possible (NOCA-FHWA-CON).

- For rock barbs, use equipment (excavator) from the bank to place rock below ordinary high water mark to reduce the potential for introducing pollutants, including possible leaks of hydraulic fluid or other substances from heavy equipment (NOCA).
- Use vegetable based hydraulic fluid in heavy equipment (NOCA-FHWA-CON).
- Limit the duration of the instream work as much as possible (NOCA).
- Time instream work to occur at lower flow periods (i.e., work would not occur during heavy river flows) (NOCA-CON).
- Minimize creation of impervious surface (NOCA-FHWA-CON).
- Use a Storm Water Pollution Prevention Plan (SWPPP) for construction activities to control surface run-off, reduce erosion, and prevent sedimentation from entering water bodies during construction (NOCA-FHWA-CON).
- Develop and implement a comprehensive spill prevention/response plan that complies with federal and state regulations and addresses all aspects of spill prevention, notification, emergency spill response strategies for spills occurring on land and water, reporting requirements, monitoring requirements, personnel responsibilities, response equipment type and location, and drills and training requirements. Use an oil and hazardous materials spill prevention, control, and countermeasure plan to address hazardous materials storage, spill prevention, and responses (NOCA-FHWA-CON).

Fish and Wildlife

- Schedule construction activities with seasonal consideration of wildlife lifecycles to minimize impacts during sensitive periods (e.g., bird nesting and breeding seasons). The timing of the construction of rock barbs and other channel or bank stabilization measures, as well as extraction of large woody debris, will be limited to avoid spawning and other sensitive periods for fish and aquatic wildlife (NOCA-FHWA-CON).
- Minimize the degree of habitat removal (vegetation clearing) by delineating construction limits (NOCA-FHWA-CON).
- Limit the effects of light and noise on wildlife habitat through controls on construction equipment and timing of construction activities, such as limiting construction to daylight hours to the extent practicable (NOCA-FHWA-CON).
- At the end of the day cover excavated pits and trenches to prevent animals from being trapped (NOCA-FHWA-CON).
- Employ soil and erosion protection best management practices on the project to minimize the potential for trapping small animals (NOCA-FHWA-CON).
- Use spill prevention measures to prevent inadvertent spills of fuel, oil, hydraulic fluid, antifreeze, and other toxic chemicals that could affect wildlife. As required by law, prepare and implement a hazardous spill plan or SPCC (NOCA-FHWA-CON).
- Maintain proper food storage, disposing of all food waste and food-related waste promptly, in a bear-resistant receptacle, and remove all garbage off-site at the end of each working day (NOCA-FHWA-CON).
- Place rock barbs from outside the wetted channel. Rock will be placed in the channel using heavy equipment from the road or bank above the ordinary high water mark (NOCA-CON).
- Conduct surveys for aquatic species prior to removal of large woody debris from the tops of logjams (NOCA).
- Obtain single pieces of large woody debris only from above the high water mark in a manner that would not destabilize the logjam (NOCA).
- Use intake screening devices to draw water from near the surface of fast-moving water habitats to avoid impacts to aquatic organisms during water withdrawal (NOCA-FHWA-CON).
- Employ, monitor and maintain erosion management measures at construction locations to minimize sediment inputs to aquatic habitats (NOCA-FHWA-CON).

- Engineer road stream crossings to facilitate aquatic organism passage and to maintain ecological connectivity (NOCA-FHWA-CON).

Special Status Species

- Determine whether northern spotted owls are nesting and then whether or not the proposed action will affect the active nest or disrupt reproductive behavior. If it is determined that the action will not affect an active nest or disrupt breeding behavior, work will proceed without any restriction or mitigation measure. If it is determined that construction activities will affect an active nest or disrupt reproductive behavior, then avoidance strategies will be implemented (NOCA).
- If after northern spotted owl protocol surveys have been completed by July 1 in the year work is planned and occupancy has not been documented at the site (as determined by the park biologist), work may begin after July 1 of that year. If the site is occupied and nesting is occurring, construction activities within a 0.7 mile radius of the nest site cannot be conducted from March 1 (the beginning of the spotted owl nesting season) through September 6 or after at least 4 weeks have passed since young fledged. This construction start date will be recommended by the North Cascades NPS Complex wildlife biologist. Temporarily close parking within pullouts within line-of-sight (0.25 miles) of the area along the road that is immediately adjacent to the current spotted owl nest activity area if identified (NOCA).
- Survey construction areas and remove amphibian species to avoid incidental impacts through dewatering and/or crushing (NOCA).
- Construct road stream crossings to allow for aquatic organism passage (NOCA-FHWA-CON).
- Monitor project implementation to ensure compliance with the conservation measures listed above, especially the seasonal timing restrictions and the final placement of the road near the spotted owl nest, and report the results of this monitoring to the USFWS. A North Cascades Complex biologist will monitor the spotted owl nest to determine if the spotted owls produce young during the year(s) of project implementation. (The biologist will also determine whether the spotted owl nest is occupied or has moved.) If young are discovered, then the biologist will estimate the age of the fledgling(s) as part of the timing restrictions described above (NOCA).
- Report progress of the proposed action and its impacts on federally threatened and endangered species, particularly northern spotted owls to the USFWS as specified in the incidental take statement in the BO in accordance with 50 CFR §13.45 and §18.27 (NOCA).
- Report any dead or injured federally-listed species found in the action area within 24 hours to a special agent of the USFWS, Division of Law Enforcement at (360) 753-7764, or to the USFWS Western Washington Fish and Wildlife office at (360) 753-9440 (NOCA).
- Align the road to avoid as many large diameter trees ("30" dbh) and those with nesting features (conifers with upper canopy crotch or mistletoe broom) as possible (NOCA-FHWA-CON).
- Complete spotted owl surveys to protocol March 1 - June 30 in the first and second years. Surveys will be completed prior to the start of construction (NOCA).
    - If spotted owls are detected during the first set of surveys, construction or other disturbance activities will not occur within 0.7 mile radius of the nest site during the breeding season (March 1 - September 6). This applies to known all nest sites if the current year nest site location is not known (NOCA-FHWA-CON).
    - If spotted owls are detected during the first year but not detected the second year, construction will begin on or after July 1 in the first year (following the 2011 surveys), and surveys to protocol will be completed (March 1 - June 30) in the second year. If spotted owls are detected, construction and disturbance activities within 0.7 miles of the nest site will not begin until after the breeding season (September 6). If spotted owls are not detected during the surveys, construction will begin once surveys are complete (July1) (NOCA-FHWA-CON).

- If spotted owls are not detected during surveys in the first or second year, construction will begin July 1 the first year, and construction will begin the second year without restriction (NOCA-FHWA-CON).

- The NPS biologist will continue to monitor throughout the breeding season (March 1-September 6) for the remainder of the project. If a spotted owl is detected during monitoring, construction and disturbance activities will stop within a 0.7 mile radius of the nest site until September 6 (NOCA-FHWA-CON).
- In addition to the measures listed above, Best Management Practices (BMP's) such as temporary erosion management and sediment control, including silt fencing, will be used. Revegetation of disturbed areas will protect soils from erosion and reduce the potential for erosion and long-term impacts to stream habitat (NOCA-FHWA-CON).

Cultural Resources

- Document the rock walls along the reroute using Historic American Engineering Record (HAER) standards if these resources will be affected by proposed road construction (NOCA-FHWA-CON).
- In the event of inadvertent discoveries during implementation of projects, the park Superintendent will stop work and consult with the SHPO/THPO and federally recognized Indian Tribes (as appropriate) as soon as possible. The policy in such cases is to halt any additional work at the discovery location and to notify cultural resources staff immediately. Until the discovery can be documented by professionals with appropriate expertise, it will be secured and all disturbance will be avoided. In compliance with the NHPA and other applicable statutes, the discovery will be assessed for its eligibility for the National Register of Historic Places (NOCA-FHWA-CON).
- In the event that human remains are discovered during implementation of any project, the park Superintendent will consult with the SHPO/THPO and federally recognized Indian Tribes as soon as possible. The policy in such cases is to halt any additional work at the discovery location and to notify cultural resources staff immediately. The location and its immediate vicinity will be secured, all disturbance will cease, and the find will be covered and protected until the presence of human remains can be confirmed. Human remains will be managed in compliance with the NAGPRA and ARPA (NOCA-FHWA-CON).
- Determine if a monitoring plan is needed pending final construction plans and the potential to affect cultural resources (NOCA-FHWA-CON).
- Monitoring will be focused where buried historical deposits are likely to be present beneath existing development. The NPS archeologist will assess the eligibility of any sites prior to construction (NOCA-FHWA-CON).
- Ensure that access to the Buckner Homestead hayfield and pasture will be via existing roads and paths (NOCA).

Visitor Experience

- Construction delays and one-lane closures will be no longer than 20 minutes. If longer delays or complete road closures are needed, they must be approved by the NPS so that visitors can be reasonably notified (NOCA-FHWA-CON).
- Construction on evenings and nights, weekends, and holidays will be avoided. If work during these times is necessary, advance approval from the NPS will be required so visitors can be reasonably notified. (NOCA-FHWA-CON).
- Distribute press releases to local media, locate signs in the recreation area, and provide information on the boat to inform visitors about road conditions in the lower Stehekin Valley during the project. The NPS will have primary responsibility for this mitigation, but all parties will maintain close coordination so accurate information is readily available for visiting public (NOCA-FHWA-CON).

- Use a public information program to warn of construction related road closures, delays, and road hazards (NOCA-FHWA-CON).
- Keep a McGregor Meadows and Lower Field route open during re-route construction (Alternatives 2, 3 and 5) (NOCA-FHWA-CON).
- Provide notice to equestrians (e.g., Stehekin Valley Ranch) regarding conditions that could make the road temporarily impassable for horse crossing (NOCA-FHWA-CON).
- Manage vehicle traffic and contractor hauling of materials, supplies, and equipment within the construction zone to minimize disruptions in visitor traffic (NOCA-FHWA-CON).
- Develop a safety plan prior to the initiation of construction to ensure the safety of recreation area visitors, workers, residents, and park staff (NOCA-FHWA-CON).
- Minimize dust during construction on public roadways (spray water but no chemicals over disturbed soil areas during dry periods and revegetate disturbed soil areas as soon as practical following construction) (NOCA-FHWA-CON).
- Daily hauling and work hours will be restricted in some areas (FHWA-CON).
- The Stehekin Valley Road will be open at all times except when large culvert installation is occurring at Wilson Creek, Thimbleberry Creek and the Milepost 8.5 creek and during paving or Milepost 8.0 work (NOCA-FHWA-CON).
- The road will remain open for all shuttle bus service, as well as the Rainbow Falls tour (NOCA-FHWA-CON).
- Emergency vehicles, hikers and bicyclists will be allowed safe passage through the work areas (NOCA-FHWA-CON).
- Night work could be approved by the Superintendent (NOCA-FHWA-CON).

Park Operations and Personnel Safety

- Provide and maintain emergency vehicle access through the project area during construction (NOCA-FHWA-CON).
- Coordinate work with park liaison to minimize disruption to normal park activities (NOCA-FHWA-CON).
- Monitor construction activities to ensure adherence to mitigation measures and to provide recommendations to minimize impacts on park resources. (NOCA).
- Conduct legal boundary surveys prior to scheduling work that may have the potential to affect private property. If necessary, easements would be negotiated (NOCA-PWR).
- Design new building construction to be silver or greater Leadership in Energy and Environmental Design (LEED) certified. Use functional, energy efficient appliances and heating and cooling systems in new buildings (NOCA-DSC).
- Design efficient circulation spaces for new maintenance and housing areas (NOCA-DSC).
- Use contractors and term employees to facilitate short-term workload increases (NOCA-FHWA).
- Coordinate work with park staff to reduce disruption to normal activities (NOCA-FHWA-CON).
- Inform construction workers about the special sensitivity of park resources and values and regulations, and provide orientation about park resources for the contractor(s) (NOCA).
- NPS staffs in coordination will routinely inspect and monitor road rehabilitation and facility construction work to proactively identify unanticipated issues that may arise. NPS will coordinate with FHWA Contracting Officers representatives to resolve the problem (NOCA-FHWA).
- Conduct formal surveys of the existing maintenance area, including contacts with staff to determine if any unanticipated spill or disposal areas are present before removal of buildings or structures and associated development (NOCA-DSC).
- Wear proper personal protective equipment for the nature of the hazardous materials identified in the surveys during all work in the affected area (NOCA-FHWA-CON).

- Refuel vehicles and equipment at least 100 feet from
water (NOCA-FHWA-CON).
- Identify areas where refueling or maintenance of equ
devices, such as temporary earth berms surrounding
- Ensure that spill clean-up materials, such as absorbe
FHWA-CON).
- Identify the locations of fueling sites, requirements f
safeguard aquatic and terrestrial habitat from constru
CON).
- Locate fuel storage tank outside of the floodplain / c
sensitive areas (NOCA-FHWA-CON).